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International *Clostridium difficile* Symposium 2010 – Special Issue

The Third International *Clostridium difficile* Symposium took place from 22 to 24 September 2010 and was once again held in Slovenia (www.mf.uni-mb.si/mikro/icds2010). This time the location was the picturesque alpine resort of Bled. The meeting followed the previous two successful meetings held in Kranjska Gora in May 2004 and Maribor in June 2007. Approximately 210 delegates from 29 countries in five continents attended the meeting.

Although the massive increase in worldwide awareness of *C. difficile* infections took place several years ago, the infection continues to hit the headlines and is a real cause for concern in many countries. The programme kicked off with a presentation by Mark Miller – with the subtitle ‘There is so much we don’t know’. The following two-and-a-bit days tried to attempt to address some of these unknowns, and achieved some success. However, there remain many questions without good answers and there will be many opportunities in future meetings to answer these.

The seven sessions each began with an invited lecture, and a further 22 oral presentations were selected from the offered papers. Also just over 100 posters were presented in two day-long sessions. The programme covered all of the important aspects of *C. difficile* research: clinical and molecular epidemiology in man and domestic animals; toxins and their action at the cellular and molecular levels; other virulence factors; the host response to CDI; spores of *C. difficile*: their structures and susceptibilities to cleaning agents; and prevention and control of CDI, including novel antibiotic and non-antibiotic therapies. Diagnosis also featured largely with discussions on the new generation of PCR-based diagnostics.

All authors who presented papers at the meeting, either oral or poster, were invited to submit their work for this special issue of the *Journal of Medical Microbiology*. The

submissions were handled by the editorial team of the journal and subjected to the normal peer review process. The papers in this special issue are the 25 that were accepted. These represent the spectrum of those presented at the meeting.

Papers on molecular epidemiology, an extremely active area of research, account for the majority of accepted papers. Solomon *et al.* (2011) described an Irish study investigating the diversity of ribotypes 027 and 078 by repetitive-extragenic palindromic PCR. Eckert *et al.* (2011) described the more commonly used multilocus variable-number tandem repeat analysis (MLVA) to subtype French *C. difficile* 027 isolates, and Broukhanski *et al.* (2011) also employed MLVA to investigate an outbreak of NAP1 and defined criteria to interpret the results. Janezic *et al.* (2011) used different molecular typing methods to study heterogeneity within toxinotypes V and III. Elliott *et al.* (2011) identified new types of toxin A-negative, toxin B-positive strains among clinical isolates of *C. difficile* in Australia. Rousseau *et al.* (2011) assessed the prevalence and diversity of *C. difficile* strains in infants.

Three papers are included on molecular diagnostics: Avbersek *et al.* (2011) compared real-time PCR methods with enrichment culture, while the use of loop-mediated isothermal amplification (LAMP) technology was employed for the identification of PCR ribotype 027 strains (Kato & Arakawa, 2011). Zidaric *et al.* (2011) compared two commercial molecular tests for the detection of *C. difficile* in the routine diagnostic laboratory.

Pathogenesis, especially the host response to infection, continues to be one of the most difficult areas to study and is poorly understood. Two review articles cover very different aspects of this field: the molecular action of clostridial toxins (Popoff & Geny, 2011) and the host response to *C. difficile* infections (Kelly & Kyne, 2011). Metcalf &

Weese (2011) compared the full binary toxin loci sequences from different *C. difficile* ribotypes in an effort to further the understanding of the regulation of the binary toxin and its putative regulator. Medeiros *et al.* (2011) have investigated the role of the haem oxygenase/carbon monoxide pathway in *C. difficile* toxin A-induced enteritis in mice. The importance of adherence in the pathogenesis of CDI continues to be debated, and a French group (Barketi-Klai *et al.*, 2011) have investigated the role of fibronectin-binding protein A in *C. difficile* intestinal colonization. The more intensively researched non-toxin virulence factors, the S-layer proteins (SLPs), are the basis of two studies. The first demonstrated that the SLPs obtained from epidemic and hypervirulent *C. difficile* strains have immunomodulatory activities (Bianco *et al.*, 2011) and the second that 027 and 001 strains share common immunogenic properties of the low-molecular-weight SLP (Spigaglia *et al.*, 2011). Buckley *et al.* (2011) described the hamster model of CDI in studies on an outbreak strain of 027 from the UK. Passive immunity for CDI is not a new idea but Mulvey *et al.* (2011) took an interesting new slant on this approach, using animal and cell adhesion assays to determine the therapeutic potential of egg yolk antibodies raised against putative colonization factors for treating *C. difficile* infection.

Although several papers were presented at the meeting on *C. difficile* in animals, only two have been included in this special issue. Thean *et al.* (2011) showed that *C. difficile* is much more common in Australian horses than previously thought, with the previously mentioned paper on molecular detection (Avbersek *et al.*, 2011) employing animal isolates.

Although several genomes of *C. difficile* have now been fully sequenced, it is useful to go back to the originally sequenced strain (630) and reannotate it to maintain the accuracy and relevance of the

information it contains. This has been done here by Monot *et al.* (2011).

Three papers have been included on antibiotics. Two are traditional susceptibility studies: one from Poland investigated the susceptibility of hospital isolates from adult patients with diarrhoea to some commonly used antibiotics as well as some of the newer fluoroquinolones (Pituch *et al.*, 2011); the other looked specifically at the disc diffusion test for testing *in vitro* susceptibility to rifaximin (Huhulescu *et al.*, 2011). The final paper on antibiotics investigated the killing kinetics of fidaxomicin and its major metabolite (OP-1118) (Babakhani *et al.*, 2011). This antibiotic is showing great promise and may soon become an important agent for treatment of CDI. Removal/killing of spores of *C. difficile* by disinfectants is a crucial measure in infection control required to prevent CDI. One paper addresses this issue but targeted the decontamination of the laboratory rather than the environment of the patient and demonstrated the importance of chlorine-releasing agents (Vohra & Poxton, 2011).

Finally, as the result of discussions that took place at the meeting between interested attendees, a paper summarizing the names of the cell wall proteins has been written in an attempt to standardize nomenclature (Fagan *et al.*, 2011).

We look forward to the next (fourth) International *C. difficile* Symposium scheduled for autumn 2012, again in Bled, Slovenia.

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